

REMARKS/ARGUMENTS

In the Office Action, claims 59-74 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Sato et al. (U.S. Patent No. 5,766,360). The rejections are fully traversed below. Reconsideration of the application is respectfully requested based on the following remarks.

Claims 59, 62, 65, and 68 have been amended to more clearly describe the claimed invention. Claims 60, 61, 66 have been canceled. New claims 75-84 have been added. Therefore, claims 59, 62-65, 67-84 are now pending.

Independent claim 59, as amended, pertains to a semiconductor manufacturing system that includes among other things “a plurality of wafer processing tools, each of the tools being attached to a respective facet on the wafer handling chamber, wherein one of the tools has attached a modular optical inspection system that reviews semiconductor wafers for defects, the modular optical inspection system including, a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer, wherein at least two of the subsystems are of different types, each type measuring a different parameter for detecting a specific wafer defect”. (Support for the amendments can be found on Fig. 1 of Applicant’s Specification) One of the many advantages of having multiple modular inspection subsystems of different types is to allow the ability to conduct different inspections while being attached to just one tool. (See page 21, lines 15-30). In addition, because of the small size and speed of the modular inspection subsystems, the overall modular optical inspection system can be incorporated with other manufacturing tools such that wafers can be inspected at various points in the manufacturing process, thus decreasing time to detection and therefore decreasing any time lost in further processing defective wafers. (See page 23, lines 9-29). Likewise, claim 65 contains a similar limitation.

In contrast, Sato et al. (U.S. Patent No. 5,766,360) does not disclose such a tool with an attached modular optical inspection system as claimed herewith. Specifically, Sato et al. merely describes an inspection chamber 58 for performing various measurements and inspections for the thin film formed on the substrate. (See Column 6 Lines 40-42) However, Sato et al. does not disclose how the various measurements and inspections are made. In other words, Sato et al. does not teach or suggest a plurality of modular inspection subsystems of different defect detection types being included in the modular optical inspection system. An advantage of having modular inspection subsystems as claimed in the present invention is to allow the ability

to easily interchange the individual subsystem modules and to quickly configure a modular optical inspection system for use in the particular application. Accordingly, it is respectfully submitted that Sato et al. neither teaches nor suggests the inventions of claims 59 and 65 as described above. Therefore, it is respectfully submitted that independent claims 59 and 65 are patentably distinct from the cited reference of Sato et al.

The Examiner's rejections of the dependent claims are respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 62-64, 67 and 68 each depend either directly or indirectly from independent claims 59 or 65 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 59 or 65. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art.

In reviewing the Examiner's rejections, the Undersigned was unable to determine the reasons for which claims 69-74 were rejected. In particular, claim 69 relates to a semiconductor manufacturing system comprising among other things "at least two inspection tools, wherein each inspection tool is configured to generate a defect report for an associated wafer processing tool; and a computer containing a defect database that collects defect reports from each of the inspection tools, whereby statistical process control of each associated wafer processing tool is performed". Claim 71 pertains to a semiconductor manufacturing system comprising among other things "a modular inspection tool attached to one of the facets of the wafer handling chamber, the modular inspection tool including a plurality of inspection sensors and metrology sensors, whereby the metrology sensors measure critical dimensions on pattern-etched semiconductor wafers". Claim 73 pertains to a method of inspecting semiconductor wafers on a wafer handling chamber comprising among other things "providing a modular inspection tool for attaching to a facet of the wafer handling chamber wherein the modular inspection tool includes a plurality of interleaved inspection and metrology sensors; performing a first scan of a semiconductor wafer with the modular inspection tool wherein the inspection sensors are used to inspect the wafer for defects; and performing a second scan of the semiconductor wafer with the modular inspection tool wherein the metrology sensors are used to measure critical dimensions on the wafer". It is submitted that these claims are patentably distinct from the cited art.

NEW CLAIMS

Applicant has added new claims 75-84. Support for all the new claims can be found throughout the specification. For example, among other places, support is found on Fig. 1. New claims 75, 79, 81, and 83 were added to similarly cover the concept wherein the plurality of modular inspection subsystems are placed adjacent to one another such that each adjacent subsystem reviews a corresponding portion of the semiconductor wafer for defects. New claims 76, 80, 82, and 84 were added to similarly cover the concept wherein at least two of the plurality of modular inspection subsystems perform the detection for defects simultaneously. New claim 77 was added to cover the concept wherein the measured parameters are selected from the group comprising of hot spots, deposition thicknesses, and critical dimensions. As for new claim 78, it was added to cover the concept wherein the at least two inspection tools in claim 69 each includes, a plurality of modular inspection subsystems each configured to detect defects on a portion of a semiconductor wafer, wherein at least two of the subsystems are of different types, each type measuring a different parameter for detecting a specific wafer defect; a mechanism for moving at least one of the semiconductor wafer and the plurality of modular inspection subsystems with respect to one another; and a master processor configured to process data delivered from at least some of the modular inspection subsystems, wherein a first one of the plurality of modular inspection subsystems includes a local processor configured to process data collected by the first modular inspection subsystem. Finally, new claim 85 was added to cover the concept wherein the plurality of modular inspection subsystems are placed adjacent to one another such that the subsystems are adjoined together side-by-side.

SUMMARY

It is respectfully submitted that all pending claims are allowable and that this case is now in condition for allowance. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

If any additional fees are due in connection with the filing of this Amendment, the Commissioner is authorized to deduct such fees from the undersigned's Deposit Account No. 50-0388 (Order No. KLA1P001C1).

Respectfully submitted,
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